REMARKS

The examiner withdrew the 112 rejections of claims 11, 14, and 23-26, but maintained the 102 and 103 rejections.

Applicant has made minor amendments to claims 17 and 23. No new matter has been added.

35 U.S.C § 102

The examiner rejected Claims 11-15 and 24 under 35 U.S.C. 102(a) as being anticipated by Deinzer et al (WO 03/043112) using (US 2006/0172171) as an equivalent English translation.

The examiner stated:

> **The Deinzer reference discloses a fuel cartridge " 1 " comprising a housing containing and in direct contact with methanol and having at least a portion of a wall "Ib" that is disposed adjacent the fuel egress port "la" of the cartridge that is comprised of metal; a fuel egress port "la" supported by the housing; and remaining walls "312" of the cartridge that are made of elastomer which is thermally insulating (See paragraphs [0064],[0067],[0072] and Figure 3).**
>
> **Examiner's note: The inner sleeve "312" is construed as being part of the wall of the housing. The limitation "sinking heat generated from external components to enhance a delivery rate of methanol in a vapor phase to the egress port of the container" is construed as intended use. Therefore, this limitation is not given patentable weight. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.**

Claim 11 directed to a fuel cartridge is allowable over Deinzer. The novel features are straightforwardly set forth in the claim as "a housing ... containing and in direct contact with a liquid source of an oxidizable fuel ... having at least a portion of a wall of the housing being comprised of a thermally conductive material ... with the at least a portion of a wall of the housing sinking heat generated from external components to enhance a delivery rate of the liquid source of oxidizable fuel ... ."

Deinzer discloses a fuel cartridge "1." Deinzer mentions that the walls of the housing can be either metal or plastic, and indeed expresses a preference for metal for certain applications. However, Deinzer also describes for all of the embodiments, that the cartridge has

a sleeve 312 and/or 314; 412 and/or 414; 512; 612; 712 and/or 714 that surrounds the methanol. Accordingly, the structure of Deinzer does not anticipate claim 11, because Deinzer cannot meet the features of "a housing, the housing containing and in direct contact with a liquid source of an oxidizable fuel" and the feature of: "... with the at least a portion of a wall of the housing sinking heat generated from external components to enhance a delivery rate of the liquid source of oxidizable fuel ... ."

The examiner argues that: **"The inner sleeve "312" is construed as being part of the wall of the housing."** However, applicant does not see how this helps the examiner's argument, because the inner sleeve is also described as being an elastomer. The only place where the fuel is in direct contact with the walls of the housing is at the egress port, but that construction would not meet the latter feature that "the at least a portion of a wall of the housing sinking heat generated from external components" because presumably the egress would be coupled to the fuel cell and not positioned to sink heat generated from external components.

In response to Applicant's prior Reply the examiner argued in part,

> **The applicant argues that Deinzer does not disclose the same structure as claimed by the applicant because it does not disclose a "housing containing and in direct contact with a liquid source of an oxidizable fuel". The examiner disagrees because as clearly shown in Figure 3 of Deinzer, the portion of the housing "lb" that forms the egress port is in direct contact with the methanol fuel.**

While this may be true, Deinzer does not disclose the complete claimed structure namely, that the fuel is in direct contact with the wall of the housing and that "the at least a portion of a wall of the housing sinking heat generated from external components."

The examiner argues thus, **"The limitation "sinking heat generated from external components to enhance a delivery rate of methanol in a vapor phase to the egress port of the container" is construed as intended use. Therefore, this limitation is not given patentable weight. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim."**

Applicant contends that the latter limitation is not a statement of mere intended use, but along with the feature of "the housing containing and in direct contact with a liquid source of an oxidizable fuel" provides structural differences over Deinzer since the inner sleeve 312 prohibits this arrangement for the reasons discussed above.

In further response to Applicant's prior reply the examiner also argues:

> **The examiner would like to point out that the part of the housing that supports the egress port "la" is not insulated by the inner sleeve "312" as shown in Figure 3. Therefore, the inner sleeve does not prohibit the housing from sinking heat generated from external components to enhance a delivery rate of the liquid source of oxidizable fuel in a vapor phase to the egress port of the container. Therefore, the examiner maintains the assertion that the limitation "sinking heat generated from external components to enhance a delivery rate of methanol in a vapor phase to the egress port of the container" is a recitation of intended use because the structure taught by Deinzer et al is capable of performing the intended use.**

Applicant's contends that the inner sleeve clearly "**prohibit[s] the housing from sinking heat generated from external components.**" The absence of the sleeve at the egress does not change this fact, and the absence of the sleeve at the egress does not permit the structure of Deinzer to meet the feature of "the at least a portion of a wall of the housing sinking heat generated from external components.", because the egress portion of Deinzer's cartridge is not configurable for sinking heat generated from external components, but is instead in contact with the fuel cell itself.

Therefore, all of the features of claim 11 are entitled to patentable weight. In particular, the functional arrangement of the portion of the housing sinking heat is entitled to patentable weight because this limitation is not merely an intended use of the claimed invention, but rather is a claimed structural difference that patentably distinguishes from the prior art.

Applicant maintains therefore, that the examiner has not shown that "the prior art structure is capable of performing the intended use," and therefore the examiner has not met his burden to show that "it meets the claim."

Accordingly, claim 11 is neither anticipated nor obvious over Deinzer.

Claims 12-15 and 24, which depend directly or indirectly from claim 11 are allowable at least for the reasons given in claim 11.

35 U.S.C § 103

The examiner rejected Claims 1-10 and 16-22 under 35 U.S.C. 103(a) as being unpatentable over Lawrence et al (US 2002/0197522) in view of Hirsch et al (US 2004/0209133).

The examiner stated:

The Lawrence reference discloses a fuel cartridge "39a" that supplies methanol to a direct methanol fuel cell comprising: a canister "92a" formed of anodized aluminum which is a thermally conductive material; a fuel bladder "86a" that is made of a plastic material which is thermally insulating; an exit port "88a", wherein at least a portion of the canister is disposed adjacent to the exit port (See paragraphs [0060],[0093],[0094]). It also discloses disposing a fuel cartridge "39" into a compartment of a portable electronic device "32" (See paragraph [0060]). It also discloses portable electronic devices such as computer laptops or notebooks (See paragraph [0064]).

Examiner's note: The housing of the fuel cartridge is construed as a two layer structure with one layer that is thermally conducting and the other layer that is thermally insulating. It is inherent that a portable electronic device such as a computer laptop comprises heat generating components. Therefore, since the fuel cartridge is in direct contact with the computer laptop, it would also be in thermal communication with a heat generating component of the portable electronic device because of the close proximity of the components. In addition, it is also inherent that a computer laptop comprises heat dissipating elements such as the CPU. Therefore, the fuel cartridge is disposed adjacent a heat dissipating element of the portable electronic device.

However, Lawrence et al does not expressly teach a surface area enhanced planar vaporization membrane residing in the fuel cartridge. The Hirsch reference discloses a removable fuel cartridge that includes a methanol delivery film that is a pervaporation membrane made of polyurethane that causes liquid methanol in the fuel cartridge to undergo a phase change to a vaporous fuel before it is delivered to the anode of the MEA (See paragraphs [0012],[0050],[0070]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Lawrence fuel cartridge to include a surface area enhanced planar vaporization membrane residing in the fuel cartridge in order to allow for the use of a high concentration fuel while using passive water management capabilities (See paragraph [0012]).

Examiner's note: The Lawrence fuel cartridge as modified by the Hirsch methanol delivery film would inherently permit heat that is generated by the component in the portable electronic device to increase a vapor pressure of the fuel in the housing to cause the fuel to egress from the cartridge as a vapor.

Claim 1 is directed to a container that supplies a source of fuel to a direct methanol fuel cell. Claim 1 includes the novel features of a housing ...having at least a portion of a wall of the housing being comprised of a thermally conductive material, a fuel egress port supported by the housing; and a surface area enhanced planar vaporization membrane residing in the container.

Neither Lawrence nor Hirsh whether taken separately or in combination describe or suggest at least these features of claim 1. The examiner principally relies on Lawrence to teach the feature of the container. Specifically, Lawrence teaches:

Removable fuel cartridge 39 generally includes an expandable fuel bladder 86, an expandable pressure member 87, and a sealable exit port 88, as shown schematically in FIG. 7. Removable fuel cartridge 39 includes a rigid canister 92 enclosing expandable fuel bladder 86 and the expandable pressure member. The fuel cartridge is dimensioned and configured such that the fuel bladder is capable of holding at least approximately 5 cubic centimeters of methanol, preferably at least

approximately 7 cubic centimeters of methanol, and most preferably at least approximately 10 cubic centimeters. In the illustrated embodiment, a pair of spring clips 93 is provided to engage canister 92 with enclosure 66 and hold the canister in place until a user removes canister 92 from the enclosure to refuel fuel cell assembly 31.

However, Lawrence teaches that 88a, the exit port, is supported on the expandable fuel bladder 86,[1] not the housing, as called for in claim 1. As for item 88 in Figure 3, it does not appear that Lawrence provides a description of the configuration of that feature. Accordingly only 88a is available to the examiner to teach what is actually disclosed by Lawrence with respect to the exit port.

In response to the Applicant's prior reply the examiner argued: "**The applicant also argues that Lawrence teaches that the exit port is supported on the expandable fuel bladder, not the housing, as called for in claim 1. Although the exit port "88" appears to be attached to the expandable fuel bladder in some of the figures, it is also supported by the housing "92" as shown in Figure 3.**" Applicant notes that some of the figures may show this or may show that the exit port protruded through the housing rather than being supported by it. It is not entirely clear. However, we note that other bases for patentability still exist.

Lawrence does not disclose "a surface area enhanced planar vaporization membrane residing in the container." The examiner uses Hirsh to teach this feature.

According to the examiner, "**The Hirsch reference discloses a removable fuel cartridge that includes a methanol delivery film that is a pervaporation membrane made of polyurethane that causes liquid methanol in the fuel cartridge to undergo a phase change to a vaporous fuel before it is delivered to the anode of the MEA (See paragraphs [0012],[0050],[0070]).**"

Applicant notes however that claim 1 includes "a fuel egress port supported by the housing; and a surface area enhanced planar vaporization membrane." Hirsh by contrast envisions a shutter mechanism for a cartridge that may include the methanol delivery film, MDF.[2] However, nothing in Hirsh suggests that MDF is a surface enhanced planar vaporization membrane.

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[1] See Lawrence Figure 10

[2] [0050] The fuel delivery regulation assembly of the present invention is shown schematically in the figures now to be described in several alternative locations relative to the other components of the fuel cell system. It should be understood that those fuel cell system components may be fabricated and assembled in a variety of different configurations. For example, the liquid fuel may be contained in a removable, replaceable and/or refillable cartridge. Such a removable cartridge may also include the methanol delivery film, MDF. Alternatively, the fuel delivery regulation assembly itself might be contained within a removable cartridge or a detachable fuel container, or may be

In response to Applicant's prior reply the examiner argues: "**The examiner disagrees because by definition a surface area enhanced planar vaporization membrane is just a membrane that enhances the rate of delivery of liquid fuel in a vapor state to the fuel cells.**" Applicant disagrees. Clearly, as described in the specification and as claimed, surface area enhanced, means more than thus a membrane; in some fashion the surface area of the membrane is increased to provide a concomitant increase in delivery rate over that provided by just a membrane that is not surfaced area enhanced.

Moreover, the examiner has not shown how Lawrence, which uses the expandable fuel bladder 86, would be modifiable by Hirsh to incorporate the MDF and how the proposed combination would still meet the features of: "having at least a portion of a wall of the housing being comprised of a thermally conductive material, a fuel egress port supported by the housing."

Therefore, any combination of Hirsh with Lawrence neither describes nor suggests all of the features of claim 1.

The examiner rejected Claims 23 and 25 under 35 U.S.C. 103(a) as being unpatentable over Deinzer et al (WO 03/043112) using (US 2006/0172171) as an equivalent English translation as applied to claim 11 above, and further in view of Lawrence et al (US2002/0197522).

> **However, Deinzer et al does not expressly teach a fuel cartridge that is configured for a specific electronic device wherein the portion of the wall of the housing of the container is configured to be disposed adjacent a heating dissipating element of the electronic device. The Lawrence reference discloses a fuel cartridge "39" that is configured for a portable electronic device "32" such that the housing of the fuel cartridge is disposed adjacent a heating dissipating element of the electronic device (See paragraph [0060] and Figures 1 and 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Deinzer fuel cartridge for use in a portable electronic device such that the portion of the wall of the housing of the fuel cartridge is disposed adjacent a heating dissipating element of the electronic device in order to more efficiently utilize the fuel cartridge as a heat sink for a portable electronic device.**

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separately detachable, as is desired based on a particular system architecture. Or, one component of the fuel delivery regulation assembly of the present invention might be contained within the cartridge, and the corresponding component may be contained within the fuel cell, or in another portion of the fuel cell system that is not in the cartridge. In other applications, the entire fuel cell system, including the components just described, may be fully contained within a singular unit or housing. A fuel cell system in any of these configurations, or combinations thereof, or other configurations are contemplated as being within the scope of the present invention.

Claim 23 recites that the cartridge of claim 11 "is configured for a specific electronic device, and wherein the portion of the wall of the housing of the cartridge is configured to be disposed adjacent a heating dissipating element of the electronic device." This arrangement is not met by the combination of Deinzer and Lawrence at least because Deinzer has the inner sleeve 312 that prohibits the claimed arrangement for the reasons discussed above, and therefore, Deinzer cannot teach that the cartridge "is configured to be disposed adjacent a heat dissipating element of the electronic device."

The examiner rejected Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deinzer et al (WO 03/043112) using (US 2006/0172171) as an equivalent English translation as applied to claim 11 above, and further in view of Hirsch et al (US 2004/0209133).

Claim 26 includes the feature that the cartridge includes "a surface area enhanced planar vaporization membrane residing in the cartridge." The examiner acknowledges that "... **Deinzer et al does not expressly teach a surface area enhanced planar vaporization membrane residing in the container.**" The examiner relies on Hirsch for this feature. Applicant disagrees. The examiner argues that: "**The Hirsch reference discloses a removable fuel cartridge that includes a methanol delivery film that is a pervaporation membrane made of polyurethane that causes liquid methanol in the fuel cartridge to undergo a phase change to a vaporous fuel before it is delivered to the anode of the MEA (See paragraphs [0012],[0050],[0070]).** The examiner argues that it would be suggested to modify "**the Deinzer fuel cartridge to include a surface area enhanced planar vaporization membrane residing in the fuel cartridge in order to allow for the use of a high concentration fuel while using passive water management capabilities (See paragraph [0012]).**"

Applicant disagrees. Again the examiner has not shown how the proposed modification can be accomplished. Recalling that Deinzer discloses that the fuel is in a bag 612[3] or within inner sleeves 312-512, it is contended that "a surface area enhanced planar vaporization membrane" would not be accommodated by the disclosed structures in Deinzer. Moreover, Deinzer discloses alternative arrangements to force fuel from the cartridge that can be accommodated by the sleeves or bags.

Accordingly claim 26 is allowable over the combination of references.

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[3] Deinzer [0084].

Please charge the Petition for Extension of Time fee and please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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